CLAIMS

What is claimed is:

1. A method for transmitting into a medium into which a plurality of transmitters may transmit, the method comprising:

a step for receiving a plurality of signals;

a step for determining a distribution model of a distribution of transmitters of the plurality in accordance with received signals of the plurality;

a step for determining a formation model of a formation in which the transmitter is positioned in accordance with received signals of the plurality;

a step for determining a total transmit power for a subsequent period of time, wherein the total transmit power is determined in accordance with the distribution model and the formation model; and

a step for transmitting not more than the total transmit power during the subsequent period of time.

2. The method of claim 1 wherein the distribution model is consistent with conventional interference limiting for aircraft traffic collision avoidance.

3. The method of claim 2 wherein:

the method further comprises a step for revising a parameter of the distribution model in accordance with the formation model; and

the step for determining the total transmit power comprises a step for determining the total transmit power in accordance with the revised parameter.

4. The method of claim 3 wherein the parameter comprises at least one of α_1 and α_2 of a conventional distribution model for aircraft traffic collision avoidance.

5. The method of claim 1 wherein:

the transmitter and at least one other transmitter are part of a formation; and

the formation model comprises a magnitude in accordance with a distance from the transmitter to the other transmitter.

6. The method of claim 5 wherein the formation model further comprises a magnitude in accordance with an altitude of the transmitter.

7. The method of claim 6 wherein the formation model further comprises a count of formation members having active transmitters of the plurality.

8. The method of claim 1 wherein:

the distribution model is consistent with conventional interference limiting for aircraft traffic collision avoidance, each transmitter of the plurality being aboard a respective aircraft;

the formation model comprises a first count of formation member aircraft that are within a first range, a second count of formation member aircraft that are within a second range greater than the first range, and a third count of formation member aircraft that are within a third range greater than the second range; and

the distribution model, being further consistent with the formation model, comprises a fourth count of aircraft within the first range excluding the first count, a fifth count of aircraft within the second range excluding the second count, and a sixth count of aircraft within the third range including the third count.

9. The method of claim 5 further comprising a step for selecting a mode of transmitter operation from at least one of an active interrogating mode and a passive non-interrogating mode, wherein selection is in accordance with the distance.

10. The method of claim 1 further comprising:

a step for transmitting during the period a plurality of first priority messages and a plurality of second priority messages; and

a step for limiting transmitting in accordance with the total transmit power and a sum of each respective power allocated to each transmission of the first priority messages and the second priority messages.

11. The method of claim 1 further for receiving transmissions transmitted from other transmitters of the plurality, the method further comprising a step for determining receiver sensitivity for receiving during the subsequent period of time.

12. The method of claim 1 further comprising transmitting into the medium in accordance with air traffic control radar beacon system signaling.

13. The method of claim 1 further comprising transmitting into the medium in accordance with Mode S signaling.

14. A memory comprising indicia of the method of claim 1.

15. A transponder comprising a processor, a receiver, and a transmitter in cooperation that perform the method of claim 1.

16. A traffic collision avoidance system (TCAS) comprising a processor, a receiver, and a transmitter in cooperation that perform the method of claim 1, wherein the processor further tracks nearby traffic and initiates annunciations to a provided display.

17. A method for tracking proximity of vehicles of a plurality, each vehicle comprising a transmitter for transmitting location information, the method comprising:

a step for receiving the location information;

a step for determining a distribution model of a distribution of transmitters of the plurality;

a step for determining a formation model of a formation in which the transmitter is positioned; and

a step for determining a total transmit power for a subsequent period of time, wherein the total transmit power is determined in accordance with the distribution model and the formation model;

a step for transmitting interrogations in accordance with the total transmit power;

a step for determining a receiver sensitivity for receiving during the subsequent period of time;

a step for receiving location information; and

a step for determining a track of a vehicle of the plurality in accordance with the received location information.

18. A memory comprising indicia of the method of claim 17.

19. A traffic collision avoidance system (TCAS) comprising a processor, a receiver, and a transmitter in cooperation that perform the method of claim 17, wherein the processor further initiates annunciations to a provided display.

20. The method of claim 17 wherein:

the distribution model is consistent with conventional interference limiting for aircraft traffic collision avoidance, each transmitter of the plurality being aboard a respective aircraft;

the formation model comprises a first count of formation member aircraft that are within a first range, a second count of formation member aircraft that are within a second range greater than the first range, and a third count of formation member aircraft that are within a third range greater than the second range; and

the distribution model, being further consistent with the formation model, comprises a fourth count of aircraft within the first range excluding the first count, a fifth count of aircraft within the second range excluding the second count, and a sixth count of aircraft within the third range including the third count.

21. A system for transmitting into a medium into which a plurality of transmitters may transmit, the system comprising:

means for determining a distribution model of a distribution of transmitters of the plurality;

means for determining a formation model of a formation in which the transmitter is positioned; and

means for determining a total transmit power for a subsequent period of time, wherein the total transmit power is determined in accordance with the distribution model and the formation model

means for transmitting into the medium in accordance with the total transmit power.

22. The system of claim 21 wherein the distribution model is consistent with conventional interference limiting for aircraft traffic collision avoidance.

23. The system of claim 22 wherein:

the system further comprises means for revising a parameter of the distribution model in accordance with the formation model; and

the means for determining the total transmit power comprises means for determining the total transmit power in accordance with the revised parameter.

24. The system of claim 23 wherein the parameter comprises at least one of α_1 and α_2 of a conventional distribution model for aircraft traffic collision avoidance.

25. The system of claim 21 wherein:

the means for transmitting is aboard a host vehicle and at least one other transmitter of the plurality are part of a formation that includes the host vehicle; and

the formation model comprises a magnitude in accordance with a distance from the host vehicle to the other transmitter.

26. The system of claim 25 wherein the formation model further comprises a magnitude in accordance with an altitude of the host vehicle.

27. The system of claim 26 wherein the formation model further comprises a count of formation members having active transmitters of the plurality.

28. The system of claim 25 further comprising means for selecting a mode of transmitter operation from at least one of an active interrogating mode and a passive non-interrogating mode, wherein selection is in accordance with the distance.

29. The system of claim 21 further wherein:

the means for transmitting transmits during the period a plurality of first priority messages and a plurality of second priority messages; and

the system further comprises means for limiting transmitting in accordance with the total transmit power and a sum of each respective power allocated to each transmission of the first priority messages and the second priority messages.

30. The system of claim 21 further comprising:

means for receiving transmissions transmitted from other transmitters of the plurality; and

means for determining receiver sensitivity for receiving during the subsequent period of time.

31. The system of claim 21 wherein the means for transmitting into the medium transmits in accordance with air traffic control radar beacon system signaling.

32. The system of claim 21 wherein the means for transmitting into the medium transmits in accordance with Mode S signaling.

33. The system of claim 21 wherein:

the distribution model is consistent with conventional interference limiting for aircraft traffic collision avoidance, each transmitter of the plurality being aboard a respective aircraft;

the formation model comprises a first count of formation member aircraft that are within a first range, a second count of formation member aircraft that are within a second range greater than the first range, and a third count of formation member aircraft that are within a third range greater than the second range; and

the distribution model, being further consistent with the formation model, comprises a fourth count of aircraft within the first range excluding the first count, a fifth count of aircraft within the second range excluding the second count, and a sixth count of aircraft within the third range including the third count.

34. A system for tracking proximity of vehicles of a plurality, each vehicle comprising a transmitter for transmitting location information, the system comprising:

means for receiving the location information;

means for determining a distribution model of a distribution of transmitters of the plurality;

means for determining a formation model of a formation in which the transmitter is positioned; and

means for determining a total transmit power for a subsequent period of time, wherein the total transmit power is determined in accordance with the distribution model and the formation model;

means for transmitting interrogations in accordance with the total transmit power;

means for determining a receiver sensitivity for receiving during the subsequent period of time; and

means for determining a track of a vehicle of the plurality in accordance with the received location information.

35. The system of claim 34 wherein:

the distribution model is consistent with conventional interference limiting for aircraft traffic collision avoidance, each transmitter of the plurality being aboard a respective aircraft;

the formation model comprises a first count of formation member aircraft that are within a first range, a second count of formation member aircraft that are within a second range greater than the first range, and a third count of formation member aircraft that are within a third range greater than the second range; and

the distribution model, being further consistent with the formation model, comprises a fourth count of aircraft within the first range excluding the first count, a fifth count of aircraft within the second range excluding the second count, and a sixth count of aircraft within the third range including the third count.